

Nebraska.—De Soto, 23d; Fremont, 18th; Marquette, 21st, 24th, 27th, 29th; North Platte, 10th, 18th; Stockham, 27th.
New Hampshire.—Mount Washington, 13th.
New Jersey.—Readington, 12th; South Orange, 19th.
New York.—Albany and Humphrey, 12th; Ithaca and Mountville, 13th.
Ohio.—Jacksonborough, 24th.
Pennsylvania.—Catawissa, 31st; Drifton, 11th; Fallsington, 5th; Philadelphia, 5th.
Tennessee.—Ashwood, 9th; Milan, 30th.
Texas.—Fort Stockton, 24th.
Utah.—Salt Lake City, 12th.
Vermont.—Strafford and Woodstock, 19th.
Virginia.—Chincoteague, 24th; Fort Myer, 11th.
Wisconsin.—Embarras, Neillsville and Wausau, 22d; La Crosse, 25th; Sussex, 23d.

SNOW.

The observer on the summit of Mount Washington, New Hampshire, reports that a light flurry of snow occurred at that station during the early morning of the 21st.

On the summit of Pike's Peak, Colorado, snow is reported to have fallen on the following dates: 11th, 23d, 24th, 28th and 29th.

Table of rainy and cloudy days, relative humidity, and dew-point for July, 1884.

Districts.	Rainy days.	Cloudy days.	Rel. humidity, %	Dew-point.
			Percentages.	
New England.....	From 12 to 18	From 5 to 11	From 71.9 to 84.6	From 53.1 to 61.0
Middle Atlantic states.....	" 10 " 18	" 4 " 10	" 64.4 " 83.7	" 57.4 " 68.2
South Atlantic states.....	" 9 " 17	" 3 " 14	" 71.2 " 83.8	" 65.0 " 74.0
Florida peninsula.....	" 7 " 16	" 2 " 7	" 71.2 " 75.9	" 73.6 " 74.4
East Gulf states.....	" 8 " 19	" 1 " 4	" 69.7 " 81.0	" 71.8 " 73.8
West Gulf states.....	" 2 " 9	" 0 " 3	" 67.1 " 80.8	" 71.4 " 76.6
Rio Grande valley.....	" 0 " 3	" 0 " 0	" 56.9 " 78.0	" 68.0 " 74.4
Ohio valley.....	" 8 " 15	" 5 " 9	" 60.0 " 73.2	" 57.5 " 66.5
Tennessee.....	" 12 " 15	" 6 " 7	" 74.3 " 78.6	" 60.1 " 68.7
Lower lake region.....	" 10 " 15	" 3 " 11	" 64.7 " 78.4	" 54.9 " 58.8
Upper lake region.....	" 10 " 20	" 1 " 9	" 69.7 " 75.0	" 49.6 " 58.4
Extreme northwest.....	" 12 " 17	" 4 " 15	" 69.3 " 82.6	" 52.2 " 55.9
Upper Mississippi valley.....	" 9 " 10	" 3 " 6	" 67.7 " 75.2	" 57.9 " 71.2
Missouri valley.....	" 13 " 17	" 2 " 6	" 69.2 " 77.0	" 57.3 " 69.0
Northern slope.....	" 4 " 15	" 2 " 7	" 43.0 " 74.2	" 35.8 " 62.2
Middle slope.....	" 0 " 12	" 0 " 5	" 43.4 " 68.0	" 47.0 " 64.2
Southern slope.....	" 3 " 7	" 1 " 3	" 50.4 " 58.6	" 54.4 " 67.7
Southern plateau.....	" 2 " 15	" 0 " 4	" 31.6 " 53.7	" 45.9 " 52.3
Northern plateau.....	" 2 " 11	" 1 " 10	" 54.8 " 59.3	" 40.4 " 53.5
North Pacific coast region.....	" 2 " 14	" 7 " 14	" 63.0 " 84.9	" 49.5 " 53.4
Middle Pacific coast region.....	" 0 " 10	" 0 " 5	" 38.8 " 87.1	" 48.0 " 55.5
South Pacific coast region.....	" 0 " 2	" 0 " 0	" 43.2 " 78.2	" 59.5 " 61.7
Mt. Washington, N. H.....	Twenty-two	Seven	91.3	43.9
Pike's Peak, Colo.....	Six	One	64.7	28.2
Salt Lake City, Utah.....	Two	None	29.6	37.4

* Relative humidity corrected for altitude

COTTON REGION REPORTS.

In the table below are shown the average precipitation and the means of the maximum and minimum temperatures for July 1884, with the July averages for the two preceding years, in the cotton districts. A comparison of these averages shows an excessive precipitation in all of the districts except for New Orleans and Vicksburg, and Galveston, where there were marked deficiencies. No decided changes are shown in the temperature, which was generally above the average.

Temperature and rainfall data for the cotton districts, July.

Districts.	Rainfall.			Temperature.						Extremes for July, 1884.	
	Average for July of two preceding years.	Average for July, 1884.	Departures.	Maximum.			Minimum.				
				Mean for July of two preceding years.	Mean for July, 1884.	Departures.	Mean for July of two preceding years.	Mean for July, 1884.	Departures.		
New Orleans.....	5.86	1.62	+ 4.15	91.8	95.3	+ 3.5	72.9	74.9	+ 2.0	106	62
Savannah.....	4.81	5.38	+ 0.57	93.3	91.9	- 1.4	71.5	72.2	+ 0.7	103	56
Charleston.....	5.84	7.15	+ 1.32	92.8	91.7	- 1.1	70.0	72.2	+ 2.2	98	50
Atlanta.....	3.34	4.38	+ 1.04	90.6	90.1	- 0.5	68.5	69.1	+ 0.6	104	47
Wilmington.....	4.03	6.01	+ 1.98	91.7	89.9	- 1.8	69.0	68.8	+ 0.2	101	59
Memphis.....	4.72	4.86	+ 0.14	89.7	90.4	+ 0.7	67.7	69.1	+ 1.4	103	56
Galveston.....	2.94	0.23	- 2.71	94.0	97.6	+ 3.6	72.5	73.8	+ 1.3	107	52
Vicksburg.....	6.89	3.86	- 3.03	90.8	94.0	+ 3.2	70.6	72.9	+ 2.3	102	53
Montgomery.....	3.41	5.52	+ 2.11	92.0	91.9	- 0.1	68.4	69.4	+ 1.0	101	54
Augusta.....	3.43	3.66	+ 0.23	92.2	92.6	+ 0.4	71.0	69.7	- 1.3	106	52
Little Rock.....	2.73	2.80	+ 0.07	91.7	94.7	+ 3.0	68.4	70.0	+ 1.6	104	51
Mobile.....	2.71	5.14	+ 2.43	94.0	93.7	- 0.3	69.8	72.3	+ 2.5	104	51

WINDS.

The most frequent directions of the winds during the month of July, 1884, are shown on chart ii. by arrows flying with the wind. In the Gulf states, Ohio valley, lower lake region, and in the Atlantic coast districts the most frequent directions were from south to west; in the extreme northwest and upper Mississippi valley they were northerly; in the Missouri valley, middle, and southern slopes they were from southeast and south; in the northern slope, western plateau districts, and on the Pacific coast they were variable.

TOTAL MOVEMENTS OF THE AIR.

[In miles.]

In the following table are given the stations reporting the largest and smallest total movements of the air in each of the various districts:

Districts.	Stations reporting largest.	Miles.	Stations reporting smallest.	Miles.
New England.....	Block Island, R. I.....	9,424	Eastport, Maine.....	4,191
Middle Atlantic states.....	Del. Breakwater, Del.....	10,542	Lynchburg, Va.....	2,174
South Atlantic states.....	Kitty Hawk, N. C.....	10,064	Augusta, Ga.....	2,493
Florida peninsula.....	Cedar Keys.....	6,311	Key West.....	5,491
Eastern Gulf states.....	Pensacola, Fla.....	5,218	Montgomery, Ala.....	3,372
Western Gulf states.....	Indianola, Tex.....	3,798	Fort Smith, Ark.....	2,650
Rio Grande valley.....	Rio Grande City, Tex.....	7,780	Brownsville, Tex.....	7,307
Tennessee.....	Knoxville.....	3,520	Nashville.....	3,294
Ohio valley.....	Columbus, Ohio.....	4,358	Indianapolis, Ind.....	3,390
Lower lake region.....	Sandusky, Ohio.....	7,848	Toledo, Ohio.....	3,729
Upper lake region.....	Duluth, Minn.....	6,440	Chicago, Ill.....	4,203
Extreme northwest.....	Fort Totten, Dakota.....	7,974	Moorhead, Minn.....	4,723
Upper Mississippi valley.....	Saint Louis, Mo.....	7,151	Dubuque, Iowa.....	3,693
Missouri valley.....	Fort Bennett, Dak.....	5,752	Leavenworth, Kans.....	3,323
Northern slope.....	Cheyenne, Wyo.....	8,135	Deadwood, Dak.....	3,642
Middle slope.....	Dodge City, Kan.....	9,795	Denver, Colo.....	5,673
Southern slope.....	Fort Stockton, Tex.....	7,669	Fort Davis, Tex.....	4,211
Southern plateau.....	Fort Apache, Ariz.....	4,719	El Paso, Tex.....	2,281
Middle plateau.....	Salt Lake City, Utah.....	4,023		
Northern plateau.....	Dayton, Wash. T.....	4,334	Lewiston, Idaho.....	1,268
North Pacific coast region.....	Fort Canby, Wash. T.....	4,339	Olympia, Wash. T.....	1,898
Middle Pacific coast region.....	Cape Mendocino, Cal.....	10,385	Red Bluff, Cal.....	4,134
South Pacific coast region.....	Yuma, Ariz.....	4,329	Los Angeles, Cal.....	3,164

On the summits of Mount Washington, New Hampshire, and Pike's Peak, Colorado, the total movements of the air were 25,815 and 12,834 miles, respectively.

HIGH WINDS.

On the summit of Mount Washington, New Hampshire, maximum velocities of fifty miles or more per hour occurred as follows: 56, se., 4th; 60, se., 5th; 70, sw., 6th; 64, sw., 7th; 64, nw., 9th; 84, nw., 10th; 60, w., 12th; 59, w., 13th; 87, nw., 14th; 84, nw., 15th; 70, nw., 16th; 70, nw., 17th; 52, nw., 19th; 56, w., 20th; 85 nw., 21st; 84, nw., 22d; 81, w., 23d; 96, nw., 24th, (maximum); 50, nw., 25th; 71, sw., 31st.

The following high velocities were reported from Pike's Peak, Colorado: 50, w., 4th; 56, w., 6th; 50, sw., 7th; 58, sw., 8th; 64, w., 14th, (maximum); 50, w., 16th; 58, w., 22d; 52, w., 29th.

Other stations reporting velocities of fifty miles or more per hour are as follows:

Fort Maginnis, Montana, 52, nw., 31st.
 Fort Assinaboine, Montana, 53, e., 19th.
 Fort Benton, Montana, 50, sw., 3d.
 Cairo, Illinois, 50, ne., 25th.
 Dodge City, Kansas, 56, ne., 9th; 50, ne., 26th.
 La Crosse, Wisconsin, 63, n., 25th.

LOCAL STORMS.

Arkansas.—Fort Smith: between 8 and 9 p. m. of the 27th a tornado passed in a southeasterly direction over portions of the Cherokee and Choctaw reservations, in the Indian Territory, crossing the Arkansas line about fifteen miles south of Fort Smith. The corn and cotton crops in the southern part of this (Sebastian) county were badly damaged by the hail, which was of unusual size, and covered the ground in some places to a depth of ten inches. The noise from the tornado cloud was distinctly heard during its passage. Only a light shower of rain and hail fell at Fort Smith.

Colorado.—Pike's Peak: a severe storm occurred at Colorado Springs on the 9th. Several houses at that place and in Manitou were flooded by the heavy rainfall.

Cañon City, Fremont county: during the night of June 30—

July 1st a "cloud-burst" occurred in this vicinity. Large quantities of rock and earth were washed out, and in numerous places the track of the Denver & Rio Grande railroad was covered with several feet of earth, a number of flat cars being almost entirely covered. The Arkansas river rose two feet. The town water-works were slightly damaged, necessitating temporary cutting off of the water supply.

Connecticut.—New Haven: a severe thunders-storm, accompanied by hail, occurred between 5 and 7 p. m. of the 19th. Hail fell for twenty minutes, the hail stones being as large as walnuts. More than two inches of rain fell during the storm which caused considerable damage by flooding cellars and basements. A high wind prevailed at this place from 5 to 8 p. m. on the 23d; the yacht "Magnet" was driven on a reef of the old light-house and sustained slight damage.

Reports from New Hartford, Litchfield county, state that a violent storm occurred at that place during the night of the 23-24th. The Greenwood Manufacturing Company's building was unroofed, and the crops sustained serious injury.

Dakota.—Huron: a severe storm prevailed between 5.15 and 6 p. m. on the 1st. A number of small buildings were blown down; the wind for five minutes blew at the rate of 55 miles per hour.

Fort Meade, Lawrence county: a tornado passed over the Red Water, Whitewood, and Spring valleys on the 1st, which destroyed barns, fencing, etc. The track of the storm was about 1,000 feet wide, and crossed the Belle Fourche river about twenty-four miles from Fort Meade. Hail fell in large quantities for about eight minutes.

Wahpeton, Richland county: reports from Fairmont, twelve miles south of this place state that a tornado occurred there on the 1st. Three freight cars were blown from the track of the Fargo Southern railroad, and a school house in the "Williams" district was entirely demolished, all of the pupils, fifteen in number, receiving more or less serious injuries.

Yankton: a severe storm prevailed at this place on the 3d and 4th; on the last-mentioned date between 5 and 7 p. m. a storm cloud was observed approaching from the northwest, but before reaching the city it divided and passed around the city. The most violent part of the storm lasted only a few minutes, prostrating many trees and causing damage to several buildings. Reports from Vermilion, Clay county, state that the storm was very severe at that place.

Sioux Falls, Minnehaha county: a very destructive storm visited this county on the 21st. Reports from Dell Rapids state that the damage caused in that vicinity is estimated at \$100,000, and at Valley Springs, at \$50,000. Seven persons were killed by lightning in this county during the storm.

Georgia.—Crawford, Oglethorpe county: an unusually heavy rainfall occurred on the afternoon of the 3d. Reports from various points in this, and the neighboring counties, state that crops were considerably injured.

Augusta: a thunder storm of considerable violence occurred between 5 and 6 p. m. of the 11th; several buildings in this city and vicinity were partly unroofed.

Illinois.—Saint Louis, Missouri, 6th: reports from Christian, Macon, Sangamon and Shelby counties, and from other localities in central Illinois, state that a very severe and destructive wind storm occurred during the night of the 4-5th. In the vicinity of Illiopolis, Sangamon county, several farm houses were badly damaged, and also wheat shocks and growing corn, the latter being beaten to the ground. The losses sustained in Sangamon county are estimated at more than \$100,000. Numerous dwellings in Macon county were wrecked, the damage in that county being estimated at \$200,000.

Hillsborough, Montgomery county: a severe storm passed over the northern and eastern portions of this county on the 23d. The wheat and hay shocks were scattered, and trees and fences prostrated. In some localities serious damage was done to the corn crop, whole fields having been beaten down by the wind and rain.

Tuscola, Douglass county: the most severe wind and rain-

storm of this season occurred during the night of the 24-25th; the growing crops in this vicinity were damaged to the extent of many thousand dollars.

Cairo: a severe storm prevailed between 6.45 and 7.55 p. m. of the 26th, the wind attaining a velocity of fifty miles from the northeast; the course of the storm was southwesterly.

Indiana.—Indianapolis: on the afternoon of the 24th, a thunder storm of considerable severity occurred at points north of this city, blowing down many trees.

Iowa.—Sioux City, Woodbury county: a tornado passed through the southeastern part of this town at 6 p. m. on the 4th. It came from the west-northwest and passed eastward. The tornado cloud is reported to have been of the usual funnel-shape, and moved with great rapidity. A church tower was blown down and the walls of the building badly damaged; a school-house and plow factory, with other small buildings were demolished. The plate glass fronts of several stores were also destroyed and a large number of trees blown down. At the oil works a large oil tank was blown down, while a pile of empty barrels directly in front of it remained undisturbed.

Wapello, Louisa county: a very severe storm occurred in this vicinity on the afternoon of the 4th; it began at 7.40 p. m., and continued for forty minutes, being accompanied by torrents of rain and a small quantity of hail of sufficient size to break windows. Shade and fruit trees were prostrated and buildings and fences demolished. The greatest damage was caused over an area about one mile wide, Wapello being in about the centre of the storm.

Dubuque: during the morning of the 23d a thunder-storm, accompanied by heavy rainfall, passed over this locality. Considerable damage was done in Dubuque by the flooding of cellars.

Knoxville, Marion county: this section was visited by a destructive wind and rain storm between 10 and 11 p. m. of the 23d. Barns and other out-buildings, trees, and fences were blown down.

Osceola, Clark county: a severe storm occurred between 9 and 10 p. m. of the 23d, which caused great damage to ornamental and fruit trees. The unharvested grain was almost ruined, and that shocked in the fields was badly scattered.

Kansas.—Iola, Allen county: during a severe storm on the afternoon of the 24th a new barn, three miles distant, was blown down.

Dodge City: a severe storm passed over this place on the evening of the 26th, reaching its greatest violence at 9.20 p. m.; the maximum wind velocity for five minutes was 84 miles per hour. The storm caused great damage in the surrounding country.

Sherlock, Finney county: at about 8 p. m. of the 26th a strong wind began, which suddenly increased in force until it reached an estimated velocity of 80 miles per hour. The most violent part of the storm lasted about five minutes. Outbuildings were demolished and the grain stacks in this vicinity were scattered. It is reported that hail stones, three inches in diameter, fell at a point twelve miles north of this place.

Kentucky.—Richmond, Madison county: during a storm which occurred at about noon of the 2d, several trees at the University grounds were blown down. The most violent part of the storm was confined to a narrow path about one hundred yards in width.

Maryland.—Westminster, Carroll county: unusually severe storms occurred in portions of this county during the nights of the 4th and 5th, which blew down trees and scattered the grain shocks.

Annapolis: a violent wind and rain storm prevailed on Chesapeake bay on the afternoon of the 24th. The steamer "Georgiana" had the windows of her upper saloon blown out when off Sandy Point.

Baltimore: an unusually severe storm occurred on the afternoon of the 12th; from 3.07 to 4.50 p. m., 3.75 inches of rain fell, and nearly all of that amount fell in one hour. A large amount of damage was caused by the flooding of cellars and basements. The storm was accompanied by a slight fall of

hail of small size, the hailstones measuring about one-fourth inch in diameter. The lightning struck numerous buildings, some of which were damaged to a considerable extent. Another severe storm occurred at Baltimore on the afternoon of the 31st. From 5.40 to 6.00 p. m., rain fell in torrents accompanied by high wind, which caused much damage. The maximum velocity of the wind was thirty-two miles per hour.

Michigan.—Detroit: a storm of unusual severity is reported to have occurred at Holland, Ottawa county, on the morning of the 23d.

Grand Haven: brisk to high variable winds prevailed during the early morning of the 23d; several shade trees were blown down, and considerable damage was done by lightning; maximum wind velocity, 38 miles, from the northeast.

Minnesota.—Saint Vincent: a violent storm swept over the valley, eight miles north of this place, on the 13th; several dwellings were wrecked, fences prostrated, stock killed, and the grain fields badly damaged.

Fergus Falls, Otter Tail county: the damage caused in this vicinity by the storm on the 23d is estimated at \$75,000.

Moorhead: a destructive storm occurred in this county at 5.30 p. m. of the 31st. The storm first struck the town of Grandin, Dakota, thirty miles north of Moorhead, and pursued a southeasterly course through Clay county, Minnesota. Hail is reported to have fallen for twenty-five minutes, covering the ground to a depth of four inches. The damage to crops is estimated at \$100,000.

Missouri.—Kansas City: reports from Rich Hill, Bates county, state that a destructive wind storm occurred at that place on the morning of the 4th. A church was entirely destroyed and numerous other buildings were injured. The damage done in Rich Hill and vicinity is estimated at \$20,000. Considerable damage was also done at Walnut, in the same county.

Nebraska.—Omaha: a violent storm occurred at 1 p. m. of the 3d, the wind reaching a velocity of forty-two miles per hour, and blowing down trees and fencing. Another severe storm occurred here about 6 p. m. on the 18th, accompanied by very heavy rain which caused damage to streets and sewers.

Lincoln, Lancaster county: at about 10.30 p. m. of the 20th, a violent storm, accompanied by very heavy rain, occurred. The residents of lower portions of Lincoln were compelled to move out of their dwellings, which were flooded.

New Jersey.—Wyckoff, Bergen county: on the afternoon of the 6th a peculiar storm occurred in the northern part of this county. A sudden gust of wind uprooted an entire orchard, and a house near by was badly strained, while at a few hundred yards distance, there was scarcely a breeze felt.

New York.—Buffalo: a severe gale occurred on the 23d, beginning at 10 a. m. and ending at 2 p. m.; at 1 p. m. a maximum wind velocity of forty miles per hour, from the west, was recorded. A large number of vessels were detained in harbor during the storm.

Poughkeepsie: a severe storm of wind and rain prevailed along the Hudson river on the afternoon of the 23d. The storm began at about 6 p. m. and lasted about twenty minutes. Many trees were uprooted and telegraph lines were prostrated. The sloop "Willis" was blown ashore at Cornwall.

Oswego: during a severe squall on the morning of the 23d, the schooner "Senator Blood" was dismasted off Kingston.

North Carolina.—Edenton, Chowan county: a violent storm occurred at this place at 5 p. m. of the 26th, which caused serious injury to a number of buildings.

Ohio.—Millersburg, Holmes county: the severe storm of the 24th caused much damage to out-buildings, orchards, etc., in this county.

Batavia, Clermont county: a severe storm of wind and rain occurred during the night of the 24-25th, which caused serious injury to the corn crop; a large barn in this vicinity was destroyed.

Pennsylvania.—Easton, Northampton county: on the evening of the 4th a tornado occurred about one-half mile north of

Jacksonville, Lehigh county. At 7 p. m. a heavy, black cloud, at a low altitude, was observed approaching with great rapidity from the southwest, and, at the same time, two others were observed, one coming from the northeast and the other from the southeast. The three clouds met at a height just above the trees at the foot of the Blue mountains, causing a noise like distant thunder, and in appearance resembling a huge balloon. Water fell in torrents from the centre of the black mass of clouds, which was about twenty feet in diameter. After the meeting of the clouds they pursued a northeasterly course, traveling at an estimated velocity of fifty miles per hour, and destroying the timber as the cloud struck the mountain here and there. The cloud which approached from the southwest caused considerable damage before coming in contact with the other clouds.

Reading: a storm accompanied by high wind and heavy rainfall, prevailed on the 6th in Berks, Lebanon, and Montgomery counties. The country roads were submerged and bridges washed away; barns and other buildings were unroofed.

Pittsburg: on the 25th the steamer "J. M. Bowell," when near Coal Centre, on the Monongahela river, was struck by a squall and capsized.

South Carolina.—Columbia: at 4.30 p. m. of the 31st, a storm passed over this city, prostrating trees and fencing. The approach of the storm cloud, which was of an unusually threatening appearance, caused considerable alarm.

Tennessee.—Clarksville, Montgomery county: at about 6 p. m. on the 2d a severe wind and rain storm lasting about three-fourths of an hour, passed over this section. At Clarksville, no damage was done other than the blowing down of a few trees, but in the surrounding country the growing crops were badly injured. At Trenton, Todd county, Kentucky, the storm was more severe than at any other point in this section; at that place numerous buildings were destroyed. A few miles from Trenton a house, in which were four men, was blown down, killing all of the men. It is reported that not less than forty barns were destroyed in the vicinity of Trenton.

Nashville: a violent thunder-storm began at 5.38 p. m. of the 5th, which resulted in considerable damage in this vicinity and in the surrounding counties. In Nashville several buildings were unroofed and many shade trees were blown down.

Knoxville: a violent storm began at 9.30 p. m. on the 5th, the wind reaching a velocity of 44 miles per hour. In this city a few trees and some fencing were blown down, and a church building was damaged. The crops in this part of the state were badly damaged.

London, London county: a violent storm visited this section during the night of the 5-6th. A large brick building on the Tennessee river was completely destroyed, together with a number of out-buildings in this vicinity.

Nashville: reports from Dark's Mill, Maury county, state that a very destructive storm occurred at that place on the morning of the 30th. The path of the storm was about one-half mile wide, within which nearly all property was destroyed.

Chattanooga: on the 31st a severe thunder storm from the southwest began at 10.50 a. m. and ended at 1.35 p. m.; a violent gust of wind prostrated small trees and insecure fencing. Numerous buildings in the city were damaged, the losses being generally slight. Reports from several of the neighboring counties, both in Tennessee and in the northern portions of Georgia and Alabama, state that the growing crops were damaged to a considerable extent. A dwelling on Look-out mountain, near Sulphur Springs, Alabama, was destroyed and one of the inmates killed.

Virginia.—Norfolk: on the afternoon of the 28th a violent storm occurred in the vicinity of Hickory Grove, Norfolk county. The largest trees were twisted off and buildings were destroyed. The path of the storm was about two hundred yards in width.

Wisconsin.—Milwaukee: a severe storm of hail and wind occurred in various portions of this state during the night of the 22-23d. It was most severe in Fond du Lac, Jefferson, Sheboygan, Walworth, Washington, and Waukesha counties.

Jefferson, Jefferson county: a violent storm from the west passed over this place at 2.45 a. m., on the 23d. Residences, barns, and other out-buildings throughout the storm's path were more or less damaged. The damage to property at Jefferson is estimated at \$50,000.

Sussex, Waukesha county: a severe thunder storm, accompanied by hail, passed north of this station at 1.30 a. m. of the 23d. Great damage was done to the grain crops.

La Crosse: a storm of unusual violence prevailed at this place on the afternoon of the 25th. It began at 3.55 p. m., a wind velocity of sixty-three miles per hour being recorded; a greater velocity was attained later, but as the anemometer became unserviceable, the exact velocity is not known. The observer estimates the maximum wind velocity at seventy-five miles per hour. The high wind caused considerable damage in this city and vicinity; in some localities the crops were seriously injured. At a point one mile north of La Crosse, hail fell in large quantities. The storm approached La Crosse from the northwest and passed off to the southeast, its track being narrow.

NAVIGATION.

STAGE OF WATER IN RIVERS.

In the following table are shown the danger points at the various river stations, the highest and lowest stages of July, 1884, with the dates of occurrence and the monthly ranges:

Heights of rivers above low-water mark, July, 1884.

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
<i>Red River:</i>						
Shreveport, Louisiana.....	29 9	1	18 2	31	7 0	11 2
<i>Arkansas:</i>						
Little Rock, Arkansas.....	33 0	4	10 6	26	6 3	4 3
Fort Smith, Arkansas.....		1	2 8	19, 23	1 4	4 0
<i>Missouri:</i>						
Yankton, Dakota.....	20 0	4, 5	19 11	25	16 10	3 1
Omaha, Nebraska.....	16 0	4	13 3	25	9 0	4 3
Leavenworth, Kansas.....	21 0	5, 6	17 3	28	13 5	3 10
<i>Mississippi:</i>						
Saint Paul, Minnesota.....	14 6	1	4 2	23	2 4	1 10
La Crosse, Wisconsin.....	18 0	1	4 2	25	1 9	2 8
Dubuque, Iowa.....	21 10	1	7 8	22	4 3	3 5
Davenport, Iowa.....	15 0	1	5 10	23	2 10	3 0
Keokuk, Iowa.....	14 6	1	6 4	25	3 4	3 0
Saint Louis, Missouri.....	30 0	17	20 10	25	14 11	5 11
Cairo, Illinois.....	40 0	10	23 2	28	15 6	7 8
Memphis, Tennessee.....	34 0	1	17 9	30	10 10	6 11
Vicksburg, Mississippi.....	41 0	1	29 7	31	19 4	10 3
New Orleans, Louisiana.....	-2 6	1	4 6	31	5 4	3 10
<i>Ohio:</i>						
Pittsburg, Pennsylvania.....	20 0	30	8 4	25	0 4	8 0
Cincinnati, Ohio.....	50 0	1	15 5	25, 27	4 10	10 7
Louisville, Kentucky.....	24 0	2, 3	7 0	25, 27, 28	3 2	3 10
<i>Cumberland:</i>						
Nashville, Tennessee.....	42 0	1	8 2	27, 28	1 10	6 4
<i>Tennessee:</i>						
Chattanooga, Tennessee.....	33 0	1	8 4	25	2 7	5 9
<i>Monongahela:</i>						
Pittsburg, Pennsylvania.....	29 0	30	8 4	26	0 4	8 0
<i>Savannah:</i>						
Augusta, Georgia.....		6	15 1	27	6 0	10 1
<i>Willamette:</i>						
Portland, Oregon.....		1	17 7	31	7 8	9 11
<i>Sacramento:</i>						
Red Bluff, California.....		1	2 5	29, 30, 31	1 2	1 3
Sacramento, California.....		1	19 4	31	11 6	7 10
<i>Mobile:</i>						
Mobile, Alabama.....		23, 27	16 11	4, 5, 17	15 0	1 11
<i>Colorado:</i>						
Yuma, Arizona.....		13, 14	27 6	30, 31	23 0	7 6

* Below bench mark. † Below high-water mark of 1874 and 1883.

All stations on the Mississippi river, with the exception of Saint Louis, Missouri, and Cairo, Illinois, report the highest stage of water on the 1st; at Cairo and stations northward the lowest water was observed from the 22d to 25th, and south of Cairo from the 28th to 31st.

The Missouri was highest on the 4th and 5th; it was lowest at Yankton, Dakota, and Omaha, Nebraska, on the 26th, and at Leavenworth, Kansas, on the 28th. At Yankton, it was within one inch of the danger-line when at its highest stage, on the 4th and 5th.

The Ohio river remained low during the month. At Portsmouth, Ohio, navigation was suspended on the 25th, on ac-

count of low water; on the 28th there were but three feet and ten inches of water in the channel. At Pittsburg, Pennsylvania, the river reached a height of eight feet and four inches above low water, on the 30th, permitting most of the coal barges, which had been detained for the past month, to proceed down the river.

The observer at Nashville, Tennessee, reports that navigation in the Cumberland river was suspended on account of low water, on the 16th.

FLOODS.

Yuma, Arizona: portions of the Southern Pacific railroad bridge over the Colorado river were washed away on the 1st and 3d.

Fayetteville, Washington county, Arkansas: reports from Drake's creek, Madison county, state that a "cloud-burst," extending over a radius of twenty miles, occurred on the morning of the 6th. White river, and Brush, Drake's, and Richland creeks overflowed, causing much damage. Six persons were drowned by the overflow of Richland creek; several houses at Huntsville were swept away and the crops in many places were ruined.

Chesterfield, Chesterfield county, South Carolina: a very heavy fall of rain occurred during the night of the 10-11th, which caused the streams in this vicinity to overflow. Numerous mills and bridges were washed away and other damage caused. At Cheraw, the rainfall is reported to have been the heaviest known for several years, and mills and bridges in that locality were washed away. The railroad between Cheraw and Wadesborough was badly damaged, causing delay of trains.

Baltimore, Maryland, a very heavy rainfall occurred on the afternoon of the 11th, 3.75 inches water having fallen in less than two hours. A large amount of damage was caused by the flooding of the lower floors and cellars of buildings; in some portions of the western part of the city the water covered the streets to a depth of five feet.

Lexington, La Fayette county, Missouri: the heavy rains on the 24th, caused serious washouts along the line of the Missouri Pacific railroad. At Concordia, Davis creek overflowed and caused an extensive break in the road at that point.

Columbus, Lowndes county, Mississippi: more than four inches of rain fell at this place on the 28th, causing damage to the growing crops in bottom lands.

Piedmont, West Virginia: rain fell continuously from 10 a. m. of the 23th, until 5 a. m. of the 29th, causing one of the most destructive freshets that has ever occurred in this vicinity. A "cloud-burst" is reported to have occurred at the head of Castle run, near Lonaconing, Allegheny county, Maryland, partially submerging that town. George's creek, a small stream, was much swollen and horses and cattle pasturing along its banks were drowned. At Barton, Allegheny county, twenty houses were washed away and three persons were drowned. At Western Port, Allegheny county, where George's creek empties into the Potomac river, a part of the town was flooded and three houses were washed away. The Cumberland and Pennsylvania railroad was badly damaged.

HIGH TIDES.

Eastport, Maine, 21st.

Scott's Hill, North Carolina, 21st, 22d.

New River Inlet, North Carolina, 22d, 23d.

LOW TIDES.

Eastport, Maine, 9th.

Indianola, Texas, 1st, 2d, 4th, 5th, 7th to 11th, 26th to 31st.

TEMPERATURE OF WATER.

The temperature of water as observed in rivers and harbors during July, 1884, with the average depth at which the observations were made and the mean temperature of the air at the several stations, are shown in the following table. The highest observed water temperatures are: 96°.1 at Indianola, Texas; 89°.7 at Key West, Florida; 88°.7 at Galveston, Texas; 88°.5 at Cedar Keys, Florida; and 88°.2 at Augusta,